

100-7-11-COPY ORIGINAL

EX PARTE OR LATE FILED

RICHTER GROUP

Communications Consultants

Henry L. Richter, Ph.D., PE

RECEIVED

2755 Alondra Way

Palm Springs, CA 92264-8754

760/322-9122

Fax 325-7364

hrichter@alumni.caltech.edu

001 22 1997

FCC MAIL ROOM

In the Matter of:

Examination of Exclusivity and Frequency)

Assignments Policies of the Private Land)

Mobile Services)

PR Docket No. 92-235

To: Mr. William F. Caton, Acting Secretary

COMMENTS CONCERNING THE APCO PETITION

This correspondence concerns the Emergency Petition for Clarification submitted by the Association of Public Safety Communications Officials-International ("APCO") submitted on October 1, 1997. The APCO Emergency Petition requests immediate clarification of the Commissions's Public Notice, DA 97-2006, released September 23, 1997. Further, this correspondence is intended to document conversations with three Staff members on October 3, 1997. The three staff members of the Wireless Telecommunications Bureau are: Mr. John J. Borkowski, Ms. Kathryn S. Hosford, and Dr. Thomas P. Stanley. My presentation and our discussion involved potentially disastrous interference to public safety communications which could result from undisciplined granting of licenses on 12.5 kHz "offset" channels in the 470/512 MHZ band. The area of greatest hazard to public safety communications is not addressed either in the Refarming Docket No.92-235 in the Public Notice (including the "sharing" criteria) or even in the APCO Emergency Petition. All of the considerations and sharing criteria relate only to the base station side of two-way repeated channels. No consideration has been given to the receive side of the frequency pair. This is where the most sensitive area of public safety communications is found; this is where the signals from weak portable radios must be adequately protected because transmissions from these portable radios often involve life or death matters for policemen and other public safety workers.

This communication is therefore intended to urge the Commission staff to consider the vulnerability of a public safety portable radio transmission to possible high-power mobile

2

transmissions on the immediately adjoining channel, 12.5 kHz, separated. I enclose a memorandum sent to the APCO Counsel, Ramsey Wordworth, Esq., of the firm Wilkes, Artis, Hedrick & Lane. In this memorandum I have attempted to explain on a more technical basis the nature of this interference hazard. If, in lifting the freeze on applications for "offset" channels, the Commission staff intended to preserve the service pool categories identified in § 90.311(a)(1) and to allow the normal public safety coordination process to prevail, then due to diligence and care on the part of the public safety application coordinators, the necessary protection can be guaranteed to existing licensees that high power, commercial mobile transmissions will not appear closely spaced in frequency. That is partly the sense of the APCO Emergency Petition for clarification referenced at the start of this communication.

Similarly, a corollary statement needs to be made and pointed out to Commission staff, and that is that the lifting of the freeze on offset frequencies in the general access pool of 470-570 MHz is not a panacea to the channel requirements of public safety users. For reasons just mentioned and explained in greater detail in the attached memorandum to Mr. Woodworth, the public safety user cannot establish and occupy a newly created offset channel which is between two commercial users who have high power mobile radios in the same or close geographic area. Weak transmissions from portable radios would frequently be lost when the base station receiver becomes desensitized (in even a minor way) by a much stronger carrier signal closely spaced in frequency. Practical experience shows this statement to be true, even when equipment becomes converted over to the new narrow band 12.5 kHz variety.

Due to the nature of public safety operations and the types of equipment involved, special protections are required in order to assure vital communications essential for the safety and preservation of the life both of the policemen and firemen and of the citizens they protect. It is important to proclaim this urgency before the Commission and the staff.

Respectfully submitted,



Henry L. Richter, Ph.D., PE

RICHTER GROUP

2755 Alondra Way

Palm Springs, CA 92264

(760) 325-9122

cc: Mr. John Borkowski
Ms. Kathryn Hosford
Dr. Thomas Stanley
Mr. Ramsey Woodworth, WAHL
Mr. Jack T. Keating, APCO
Mr. John Ramsey, APCO

October 6, 1997

279-1.762

MEMORANDUM

TO: Mr. Ramsey Woodworth, Esq.
Wilkes, Artis, Hedrick & Lane

272-2.rw

FROM: H. Richter

September 29, 1997

SUBJECT: Difficulty in Offset Sharing Criteria

- - - - -

These thoughts pertain to a serious hazard to public-safety communications that will result from the potential licensing of commercial or unregulated users on 12.5 kHz offset frequencies adjoining those used by public-safety entities. A sharing criteria has been developed by a "consensus of the coordinators" and specified a 30 dB margin between the offset licensees. This obviously refers just to the base station side of the repeater operation, and it is the input or receiver side that we have had to be most careful with in terms of using offsets.

The author has considerable experience with arranging for and testing offset frequency possibilities in the Los Angeles basin. Probably 40 of these have been licensed (under a waiver) up to the present time. The coordination and field work that has been done so far has been using the present 25 kHz channelized equipment and therefore is not directly applicable to 12.5 kHz equipment *except where the wider bandwidth equipment is still in use and the nearby offset operation is proposed.*

Public-safety radio operations depend strongly on the use of portable radio communications, often in marginal communications situations, such as inside buildings. The portable radio is the vital lifeline used by a policeman, fireman, or other emergency worker, and a missed transmission may cause serious harm. For this reason, all public-safety frequency coordination work done in Southern California depends strongly on actual field testing to avoid interference and does not trust engineering calculations or computer derived propagation prediction maps.

In Southern California we have long differentiated between nuisance interference and destructive interference. Nuisance interference are those signals heard on a channel (such as operating in the monitor or carrier squelch mode) which are annoying but do not disrupt communications by the using department. On the other hand, destructive interference is that which obliterates transmissions by capturing a receiver or causing modulation splatter on top of the signal. The technique that is commonly used in frequency coordination testing is to have the proposed new user transmit with his strongest mobile unit from that area most likely to create interference. This could either be from the nearest jurisdictional boundary of the proposed user or from an elevated site. The present licensee then arranges to have transmissions made from a portable radio in the most disadvantageous portion of his jurisdiction and to see if that signal can be received as well with the test interference as without it. If significant degradation to the weak portable radio system occurs, then either a power reduction on the part of the new user is required, or the coordination is declined.

We have learned over the course of the years how to successfully coordinate offset frequency sharing in Southern California, and this is mainly by using a combination of distance attenuation and terrain shielding. We have run many tests where interference has occurred or even receiver desensitization has occurred, and these problems become obvious when the tests described above are carried out. It has been found that receiver desensitization has often been a significant source of interference although that type of interference is not heard even in an open receiver. Desensitization can occur from any nearby powerful signal which is able to penetrate the receiver acceptance bandwidth mask (and thereby be noticed by an increase in limiter current) but not be heard.

Now, back to the subject at hand -- that of the harm posed to transmission from public-safety portables in an offset sharing environment, such as could come about with the combination of the Refarming Rules and the release of the freeze on offset frequencies.

The fact that new equipment would be configured for 12.5 kHz bandwidth operation does not have that much of an effect on the interference that could be caused to 25 kHz wide receiving equipment. Even an unmodulated carrier 12.5 kHz offset from the offset frequency of a 25 kHz wide receiver input could create enough energy through the input bandwidth mask to cause limiter current and therefore desensitization. There is not really any engineering criteria that can be invoked to adequately protect against offset channel interference to the weak signals of portable radios in the present environment. Such a set of calculations could undoubtedly be prepared, but they would have to be so conservative as to almost preclude any offset channel operation within the proximity of tens of kilometers. Running actual tests with the actual equipment is the only proven and tried method of allowing offset channel operation in the public-safety bands.

It is claimed that there will be enough exchange between coordinators to signify potential dangers of offset channel licensing in close proximity. The allowing of widespread licensing of offset channel use by organizations with powerful mobile radios will cause disastrous and dangerous interference potential to a radio service where the reception of individual weak transmissions can affect life or death in many situations.

HLR

HLR